

WHAT IS CLAIMED IS:

1 1. A thermal barrier coating comprising a base material of a heat
2 resistant alloy and a ceramics layer formed on said base material for
3 enhancing a heat resistance of said base material, wherein said ceramics
4 layer comprises ZrO_2 added with Yb_2O_3 as a stabilizer.

1 2. A thermal barrier coating as claimed in Claim 1, wherein said
2 stabilizer further includes Er_2O_3 .

1 3. A thermal barrier coating as claimed in Claim 1, wherein a
2 Yb_2O_3 addition quantity in said ceramics layer is 8 weight % or more and
3 27 weight % or less.

1 4. A thermal barrier coating as claimed in Claim 2, wherein a
2 Yb_2O_3 addition quantity in said ceramics layer is 0.1 weight % or more and
3 25 weight % or less and an Er_2O_3 addition quantity in said ceramics layer
4 is 0.1 weight % or more and 25 weight % or less and a total of said Yb_2O_3
5 addition quantity and said Er_2O_3 addition quantity is 10 weight % or more
6 and 30 weight % or less.

1 5. A thermal barrier coating as claimed in Claim 1, wherein said
2 ceramics layer has fine pores formed therein and a porosity of said pores
3 relative to said ceramics layer is 8% or more and 15% or less.

1 6. A thermal barrier coating as claimed in Claim 2, wherein said
2 ceramics layer has fine pores formed therein and a porosity of said pores
3 relative to said ceramics layer is 8% or more and 15% or less.

1 7. A thermal barrier coating as claimed in Claim 1, wherein said
2 ceramics layer has cracks, elongating in a thickness direction of said

3 ceramics layer, introduced in said ceramics layer.

1 8. A thermal barrier coating as claimed in Claim 2, wherein said
2 ceramics layer has cracks, elongating in a thickness direction of said
3 ceramics layer, introduced in said ceramics layer.

1 9. A thermal barrier coating as claimed in Claim 7, wherein said
2 cracks in said ceramics layer elongate in the range of $\pm 40^\circ$ relative to the
3 normal line to a face of said ceramics layer.

1 10. A thermal barrier coating as claimed in Claim 8, wherein said
2 cracks in said ceramics layer elongate in the range of $\pm 40^\circ$ relative to the
3 normal line to a face of said ceramics layer.

1 11. A thermal barrier coating as claimed in Claim 7, wherein an
2 interval between said cracks, adjacent to each other, is 0.05 to 1 times of a
3 thickness of said ceramics layer.

1 12. A thermal barrier coating as claimed in Claim 8, wherein an
2 interval between said cracks, adjacent to each other, is 0.05 to 1 times of a
3 thickness of said ceramics layer.

1 13. A thermal barrier coating as claimed in Claim 7, wherein said
2 ceramics layer in which said cracks are introduced has a corrosive
3 component penetration preventing layer, made of the same material as said
4 ceramics layer, formed on said ceramics layer.

1 14. A thermal barrier coating as claimed in Claim 8, wherein said
2 ceramics layer in which said cracks are introduced has a corrosive
3 component penetration preventing layer, made of the same material as said
4 ceramics layer, formed on said ceramics layer.

1 15. A thermal barrier coating as claimed in Claim 13, wherein said

2 corrosive component penetration preventing layer has a thickness of 5 to
3 50 μm and a porosity of 4 to 20%.

1 16. A thermal barrier coating as claimed in Claim 14, wherein said
2 corrosive component penetration preventing layer has a thickness of 5 to
3 50 μm and a porosity of 4 to 20%.

1 17. A thermal barrier coating as claimed in Claim 1, wherein a
2 metallic bond layer is provided between said base material and said
3 ceramics layer.

1 18. A thermal barrier coating as claimed in Claim 2, wherein a
2 metallic bond layer is provided between said base material and said
3 ceramics layer.

1 19. A manufacturing method of a thermal barrier coating
2 comprising the steps of manufacturing a thermal spraying powder by
3 mixing together a Yb_2O_3 powder and a ZrO_2 powder and forming a
4 ceramics layer on a base material of a heat resistant alloy by a thermal
5 spraying process using said thermal spraying powder.

1 20. A manufacturing method of a thermal barrier coating as
2 claimed in Claim 19, wherein said thermal spraying powder is further
3 mixed with an Er_2O_3 powder, in addition to said Yb_2O_3 powder and ZrO_2
4 powder.

1 21. A manufacturing method of a thermal barrier coating as
2 claimed in Claim 19 or 20, further comprising the step of introducing
3 cracks in said ceramics layer when said thermal spraying process is carried
4 out using said thermal spraying powder.

1 22. A turbine part comprising a thermal barrier coating as claimed

2 in any one of Claims 1 to 18.

1 23. A gas turbine comprising a turbine part as claimed in Claim

2 22.